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THE STRUCTURE AND OPERATION OF LANGUAGE.

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TO DISPEL THE MYSTERIES SURROUNDING LINGUISTICS, ENGLISH TEACHERS SHOULD UNDERSTAND CERTAIN FEATURES OF THE LANGUAGE AS THEY ARE PERCEIVED BY THE LINGUIST. THE LINGUIST SEES LANGUAGE AS "A SYSTEM OF PATTERNED VOCAL BEHAVIOR BY MEANS OF WHICH MEN COOPERATE IN SOCIETY." BY USING RIGOROUS SCIENTIFIC METHODS, HE STUDIES REPRESENTATIVE AND AUTHENTIC SAMPLINGS OF THE LANGUAGE, FIRST ANALYZING THE SPOKEN FORM OF IT. TO DESCRIBE ORAL ENGLISH ADEQUATELY, THE LINGUIST MUST (1) PROVIDE A PHONEMIC INVENTORY BY BREAKING UP THE CONTINUUM OF SOUND INTO UNITS OR PHONEMES, LARGELY THROUGH THE TECHNIQUE OF MINIMAL PAIRING, (2) ANALYZE LANGUAGE FORMS BY ISOLATING MORPHEMES THROUGH THE TECHNIQUE OF RECURRENT SAMES, (3) DISTINGUISH THE ORDER OR SYNTAX OF THE LANGUAGE, AND (4) RELATE THE ELEMENTS OF A CONSTRUCTION TO EACH OTHER THROUGH IMMEDIATE CONSTITUENT ANALYSIS TO NOTE INTIMATE CONNECTIONS OF EITHER INDIVIDUAL MORPHEMES OR SENTENCE PARTS. APPLYING SIMILAR METHODS OF APPRAISAL, THE LINGUIST NEEDS TO DEVISE WRITTEN SIGNALS--OFTEN INADEQUATELY RECORDED IN STANDARD ENGLISH WRITING--WHICH PARALLEL THE INFLECTIONS, PRONUNCIATIONS, STRESS, AND INTONATION SIGNALS APPARENT IN ORAL LANGUAGE. (THIS ARTICLE APPEARED IN "LANGUAGE, LINGUISTICS, AND SCHOOL PROGRAMS, PROCEEDINGS OF THE SPRING INSTITUTES, 1963." CHAMPAIGN, ILL., NCTE, 1963.) (JB)

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THE STRUCTURE AND OPERATION OF LANGUAGE

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In his excellent glossary of linguistic terminology, Mr. Weiss has referred to linguistics as "This mysterious science." What I should like to do in this introductory lecture is to dispel a little of the mystery. Too often linguistics suffers from seeming to appear involved and technical, when really it is little more than organized common sense.

Since, as meetings of this kind go, we are a fairly small and informal group, it will be most helpful, I believe, if I deal simply and informally with certain features of language as they are viewed by the linguist and try to explain why he looks at them as he does. I shall try, particularly, to select for treatment those particular aspects of language which will come up for discussion during the course of this institute.

In fact, it is difficult to avoid being selective. The topic of this morning's task is broad enough for a book as comprehensive as Bloomfield's *Language* or for a year's course at an upper class or graduate level. It would be all too easy to try to cover far too much territory. Consequently I shall limit myself to a fairly detailed presentation of three or four ways in which the linguist looks at language, in each instance attempting to indicate the primary unit or units that he recognizes, to suggest how he isolates them and in particular how he sees them as fitting into a pattern or organization.

We may best begin with a frequently quoted definition of language as "a system of patterned vocal behavior by means of which men cooperate in society." Notice that the words *system* and *pattern* both occur, that the behavior is vocal, that the linguist is interested in language as behavior, and that the linguist's approach to behavior is in terms of what it does, the role it plays. Linguists usually no longer define language as a medium of communication by means of which thoughts, ideas, and feelings are expressed. The current approach is essentially behavioristic. Please keep this definition in mind as I select three or four aspects of it and try to explain why the linguist looks at language in this way and how he proceeds to study it.

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Language and Sound

First of all, language has sound. Remember that our definition specified "patterned *vocal* behavior." Moreover, Mr. Weiss's glossary mentioned structural linguistics as being based upon "the primacy of speech." Unfortunately linguists have not been successful in explaining why and to what degree we are interested in the spoken language, what we mean by *primacy* in connection with the spoken language, and where the written language comes into our purview.

For one thing, *primacy* means simply examining and analyzing the spoken language first. Not infrequently reduction to writing obscures some of the neatly patterned features of the spoken language, that is to say of the language itself. We may take the inflection for plurality as an illustration.

From the point of view of pronunciation we have three variations of the inflection for regular noun plurals. After voiceless consonants such as *p, t, k,* and *f* we pronounce an *s: caps, cats, books, cuffs.* After voiced sounds, which would include *b, d, g, v,* or any vowel, we pronounce a *z: cabs, loads, dogs, leaves, tees.* After any one of six sibilant sounds, represented by the series *caress, fez, mesh, garage, etch, edge,* we pronounce a neutral vowel followed by *z,* [ə z]. One can scarcely fail to see the patterning here. The voiceless inflection is added to a voiceless consonant, the voiced inflection to a voiced sound, and in the case of sounds which are phonetically similar to the inflection itself, the latter is protected by means of the insertion of a vowel. The identical distribution prevails in the genitive singular inflection of nouns and the third person singular, present indicative of verbs. A pattern of similar distribution is used with the past tense and past participle forms of regular verbs *(looked, lugged, waited, waded),* in which the written inflection *-ed* has three values in pronunciation: [-t, -d, -əd].

The Relationship between Speech and Writing

There are times when the writing system does more than merely obscure the patterning of the spoken language; it does not record it at all. The definite article is a case in point. The indefinite article has one form (*a*) when it precedes consonants, another when it precedes vowels, (*an*). This is clearly reflected in our spelling system. But from the point of view of pronunciation, the invariably spelled *the* has precisely the same distribution in most parts of the country: [ðə] before consonants, [ðɨ] before vowels. Compare *the book* with *the apple.*

Our writing system is particularly inept at revealing the patterning of such features of language as stress and intonation. Again a single example will suffice. Let us suppose that I have said to someone, "I'm going downtown." His response is a word which can be spelled in only one way: "*Where?*" Yet this ambiguous spelling fails to reveal the most important fact about the word, namely the choice of intonation pattern. If the word is pronounced with a downward intonation turn (Wh\ere?), I will interpret it as a request for further information, and my reply will specify a particular place or places—the bank, the post office, the public library. But if there is an upward intonation turn superimposed on the word (Wh/ere?), I will understand this as a request for repetition and an indication that my original statement was either not heard or not understood.

Moreover, this distinctive use of the two intonation patterns applies not merely to *where,* but to *when, how, why, who, what,* in short to any of the interrogative words which can begin a sentence. It is a part of the system of the language, an instance of patterned vocal behavior. Yet, if we depended wholly upon written English to display the structure of the language, we would remain quite innocent of the existence of the particular pattern which has just been described. This is why anyone interested in language from a scientific point of view gives his attention first to the spoken form of it and seeks to describe its various patterns. After that he will turn to the writing system and deal with it in the same rigorous and systematic manner.

There are other considerations with respect to the general nature of language which also emphasize the primacy of the spoken over the written form. The first of these is the relative age of the two. Writing began approximately 6,000 years ago. Just how long man has been speaking is a mystery, but conservative estimates seem to indicate at least 500,000 years. Moreover, we must not overlook the fact that many of the 3,500 languages of the world have not been reduced to writing at all. This enables us to say that there are many spoken languages which are not written, but there are no written languages that are not spoken or have not been spoken at some time.

Furthermore, there is the matter of the relative amount of speaking and writing. It has been estimated that each one of us speaks about the equivalent of a small novel weekly. I seriously doubt, even in this highly literate age, that the writing one does even approaches this amount. Finally, if one considers the development of language within the individual, it is evident that every person has been speaking some four or five years before he is able either to read or to

write. All of this simply serves to reinforce our earlier conclusion that we must make our initial analysis of the spoken language.

After that has been done, it is most important that we turn to the written language and describe it in the same rigorous and objective fashion. Among other things, we should be able to determine from a comparison of the two precisely those adjustments the written language must make to compensate both for what it does not adequately record, particularly stress and intonation, and for what it cannot conveniently record: hesitation pauses, false starts, change of direction.

I am certain we would all agree that a stenographic record of ordinary speech is not at all an effective instrument of communication in writing. There has been no better illustration of this than the recent tendency on the part of certain newspapers to give verbatim reports of presidential press conferences. As we read these we can all see what happens when the actual running speech is taken down just as it comes from the mouth of the speaker while he is still thinking, still formulating his answers. Moreover, it really makes very little difference who is president; the incoherence, the anacolutha are fairly standard.

The Phoneme

In dealing with the spoken language, the linguist's first responsibility is to break up the continuum of sound into discrete units. The unit which he recognizes is the phoneme. I mention this with some hesitation because a member of the audience with whom I was speaking only a little while ago complained that at conferences of this sort and with speakers like myself, one rarely got beyond the phoneme. I trust that I shall not bog down at this point. Having recognized its existence, as the smallest significant or meaningful unit of language, we need merely to indicate how it is isolated or identified.

The technique of minimal pairing is normally employed in making a phonemic inventory of a language. If, in English, we take two such sequences of sounds as *pet* and *pat,* identical in every feature but one, and if we decide that the two sequences constitute different words, we then conclude that /e/ and /æ/ are different phonemes. This seems obvious enough, yet we must recognize that not all occurrences of the /æ/ phoneme are identical. The vowel of *pat* differs markedly in duration from the vowel of *pad;* the vowel of *can* may be nasalized or have a nasalized off-glide. Moreover, two sounds may belong to the same phoneme yet not be identical in manner of produc-

tion. Thus, the *p* in *pin* is pronounced with considerable aspiration accompanying the plosion, and the *p* in *cup* need not be exploded at all. The phonemic inventory varies considerably from language to language, constituting one of the major difficulties in foreign-language teaching. A native speaker of Spanish may pronounce *eso* with the vowel of *bet* or with the vowel of *bait*. It will still be the same word. But *met* and *mate* are not the same word in English, nor are *fool* and *full*. These last two vowels are also members of the same phoneme in Spanish.

Once the phonemes in a language have been identified, we are again able to see something of a pattern in them from the point of view of mode of articulation. For example, the nine simple vowels of English, according to the system described by Mr. Weiss, fall neatly into a three by three pattern: three degrees of height, three degrees of tongue position, with the back vowels further characterized by lip-rounding and the front and central series produced with the lips spread. Many of our consonants occur in matched voiced and voiceless pairs. The stops and the nasals are characterized by the same three points of articulation: bilabial, alveolar, and velar. The clustering or combination of sounds lends itself to the same type of orderly description. Obviously all of this is inherent in speech rather than writing, lending further support to the concept of the primacy of speech.

Forms: The Morpheme

In addition to having sound, language has form. We speak of the description and analysis of the forms of language as morphemics. Let me digress here just long enough to point out that the terminology of current linguistics depends to a considerable extent upon one prefix and one suffix. The suffix is *-eme*; the prefix is *allo-*. They were mentioned briefly in connection with the sounds of language. The suffix *-eme* is used to identify a significant unit that can be isolated by means of some consistent process. It can be applied to any of the various aspects of language: *phoneme,* a significant unit of sound; *morpheme,* a significant unit of form; *tagmeme,* a significant syntactical unit or possibly unit of order; *sememe,* a unit of meaning; *grapheme,* a unit of the writing system. One could go beyond this and create other terms on the same pattern if he desired. The prefix *allo-* is just as widely applied to nonsignificant variants of each of the units. At the time of Shakespeare, for example, the characters *u* and *v* were allographs of a single grapheme.

If you have a firm concept of the linguist's intent in his use of

the *-eme* suffix and the *allo-* prefix, linguistics will be that much less mysterious to you, because this terminology is very handily employed. At one time I became concerned over the terminological problem in linguistics and went to some pains to compare the experiences of linguists with those of scientists in other disciplines. I learned, in the course of my looking about, that virtually all new sciences and those which are striking out in new directions have their terminological problems. This is especially true when the terminology is to be couched in the English language. Of all the languages of Western Europe, only English has a learned sector of its vocabulary, primarily Greek and Latin based, so definitely divorced from its everyday word stock, that self-definition or easy characterization in a scientific term is virtually impossible. I discovered also that people in some of the other sciences, particularly psychology, felt that we had handled our scientific vocabulary rather well.

Morphemics has already been defined as the concern with form. The minimal formal unit is the morpheme. The glossary you have distinguishes for you between free and bound morphemes in a manner adequate for our purposes. The English language, by virtue of its very structure, does pose certain difficulties in isolating morphemes. For one thing, over the centuries we have come to depend more and more upon function words to indicate relationships which were formerly signalled by inflections.

The English genitive is a particularly good illustration of this. Originally all genitive relationships were marked by an inflectional ending. We still use the genitive inflection for certain kinds of relationships. We say *John's book, horse's tail, a day's work, St. Luke's Hospital.* Notice, incidentally, that by no means all of these show possession. There are certain other types of expressions which used to employ the inflected genitive but which no longer do so. The partitive type of construction as in *a glass of water* or *three of them* cannot be expressed by means of an inflection. Nor can *crown of thorns,* which also used to have the form *thorns' crown.* But just as there are some kinds of constructions which demand, without exception, the function word *of,* so there are others in which the inflection is equally invariable—we cannot say *world's fair* in any other way. Moreover, some constructions like *horse's tail* or *tail of the horse* permit the use of either the inflectional suffix or the function word *of.* Naturally, an adequate description of the language will have to deal competently and accurately with these problems of distribution.

Because of the rather peculiar stage in which the English language finds itself at the present time, arrested between a small num-

ber of widely applied inflectional patterns and what is, in all probability, a progressively greater use of function words, we do have difficulties. Auxiliary verbs are exercising modal, aspectual, and even temporal functions. Prepositions are doing the work formerly performed by case endings. Only a minority of our adjectives indicate degree by means of the inflections *-er* and *-est*. This is one aspect of our concern with form.

One cannot, however, limit his observation of form to inflectional suffixes. The process of word formation or word derivation also enters into the picture. For example, an observation of such combinations as *blackness, kindness, softness, laziness,* suggests to us that *-ness* may be added to an adjective to form an abstract noun denoting a condition or quality of. Thus *-ness* is a bound morpheme just as the inflection for plurality or that used to indicate past time. So is the ending *-er* which converts verbs into agentive nouns: *baker, singer, writer, rider.*

We recognize morphemes not so much through the technique of minimal pairing, as we did the phonemes, but rather in terms of what the linguist calls recurrent sames. How this might operate has already been suggested in connection with the suffix *-ness*. Its recurrence with a large number of adjective stems, coupled with a modification of meaning and grammatical function that is just about the same in every instance, isolates or identifies it as a bound morpheme. Likewise, a series such as *propose, protect, project, progress* serves to establish the existence of *pro-* as a morpheme. Someone has aptly called morphemes the building blocks of language.

The process is not always this simple, however. Difficulties will arise with a noun such as *calf*. According to the regular pattern of plural formation, as it is seen to operate with words like *cuff, muff, whiff,* and *skiff,* the plural ought to be *calfs,* adding the voiceless inflection to a stem ending in a voiceless consonant. But the plural is *calves,* with *-es* pronounced as [z]. Therefore it becomes necessary to recognize *calv-* as an allomorph of *calf,* in order that we may account for the addition of the voiced inflection in the plural. In a sense this is not too different from the conventional rule for plurality for such nouns as *calf, knife, wife,* and others, in that the results are the same, but actually it has two advantages. In the first place, it enables us to operate with our concept of the morpheme; moreover, it provides a mechanism for taking care of such forms as *wreath, mouth,* and *house* where there is also a voicing of the final consonant of the morpheme, but where the phenomenon is concealed by the spelling.

I should like also to call your attention to the convenient concept of the zero allomorph, which likewise adds neatness to our description of the language. We may observe, for example, that the noun *sheep* adds an inflection to form the genitive singular and also to form the genitive plural. But the common case of the plural is identical with the singular. Since, except for this one ending, there is a full panoply of forms, and since most nouns do add an inflectional ending here, we say that *sheep* in this instance takes a zero allomorph. We would account for the past tense of *put* and indeed the third person singular present subjunctive of verbs in the same way. Thus the concept of zero, that is to say adding nothing as a deviation from the normal practice, is a convenient way of stating a fact and at the same time adhering to the concept of pattern.

Syntax

The third feature of language to which the linguist gives his attention is order, the ordering or arrangement of morphemes. We often speak of this as syntax, a word which can be understood in terms of its etymology. The word is from the Greek. The prefix *syn-* means "together." The second part of the word comes from the verb *tassein,* "to arrange." Thus, syntax is primarily a study of the way in which parts of an utterance are put together, the order which they follow. This is of particular importance for the student of English because in our language so much that used to be signalled inflectionally now depends upon word order. The contrast between a statement and a question boils down in essence to the relative order of subject and verb. In a sentence like *John kicked James,* we immediately interpret the kicker and the kickee in terms of the position of the nouns with respect to the verb. In the sequence an *awful pretty dress* as compared with *a pretty awful dress,* we again identify intensifier and adjective in terms of a fixed order.

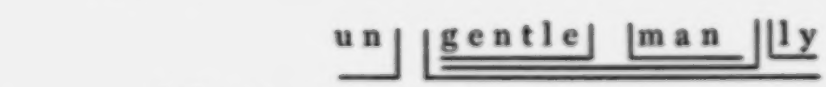
It must be confessed, however, that this is not always as simple as it may seem; some orders in English are rigidly fixed whereas others permit a certain amount of variation. Among the adverbs in English there are certain words, such as *seldom, often, never, rarely,* whose principal function is to indicate frequency. Notice that it is quite possible to say either *He often comes here* or *He comes here often.* It is much easier to vary the position of *often* than it would be to vary the position of *never.*

Thus, one of our problems is to distinguish between word order patterns which are obligatory and those which are permitted, and to separate these from those which cannot be employed.

We get into one basic difficulty in our treatments of English grammar which involves syntax to a degree. This arises from the circumstance that a part-of-speech classification based wholly upon formal considerations cannot be wholly reconciled with one based upon position in the sentence. Consequently, those who attempt to work with definitions of nouns, adjectives, and verbs which are based upon form find themselves forced to make a distinction between a *noun,* that is a word which satisfies the inflectional requirements of the category, and a *nominal,* a word which satisfies the functional or positional but not the inflectional requirements of the category. Consequently, in the works of such English language scholars as Henry Lee Smith, Jr., Archibald Hill, and James Sledd, you will find nouns and nominals, verbs and verbals, adjectives and adjectivals.

Immediate Constituents

A fourth way in which the linguist looks at language is in trying to understand the relative relationship of the elements of a construction to each other. This is generally referred to as immediate constituent analysis. It is probably most easily illustrated on the level of individual morphemes, although the principle would apply with equal facility to sentence parts. We may begin with the word *ungentlemanly,* recognizing that it consists of the morphemes *un-, gentle, man,* and *-ly,* respectively. There is no question that *gentleman* constitutes the core of the combination, and that the two morphemes which comprise it are more intimately related to each other than to the remaining two. The real question arises when we try to decide which of the two, *un-* or *-ly,* is most peripheral to the entire combination. Upon examination we can see that the whole combination actually must consist of *un-* + *gentlemanly;* it could not consist of *ungentleman* + *-ly* since *ungentleman* does not exist. Consequently the relationship of the parts might be diagrammed as follows:



Although, for the sake of simplicity, immediate constituent analysis has been illustrated on the level of the relationship of the component parts of a single word, the same problem arises in connection with virtually every sentence of a complexity beyond that of *Birds fly.* Witness the following: "He stands upon a platform of loose planks laid over needle beams and roped to a girder near the connection upon which the men are at work." Note that "upon a

platform" has the most immediate connection with *stands*, that "of loose planks" is the major segment dependent upon *platform*, that *laid* and *roped* are in parallel construction referring to *planks*, and so on. Presumably this feature of the syntax of English is vital to the sensitivity and pliability of the language as a medium of communication, and hopefully, an awareness of this on the part of student and teacher may lead to more effective command of language.

Generative Grammar

One of the very promising recent developments in the study of grammar is what is now often referred to as generative or transformation grammar. There is insufficient time to do anything more than say a few words about it by way of introduction; nevertheless I believe that we must disabuse ourselves of the notion that the two terms are anything like synonymous. The term *generative* is concerned primarily with the purpose of grammatical study, which according to its adherents is to formulate a grammar of a language in such a fashion that it will generate all of the grammatical sentences of a language and none of the ungrammatical ones. Actually, I am inclined to doubt that generative grammar and descriptive grammar are necessarily mutually exclusive terms. Certainly many of the descriptivists assumed that their grammars would serve as a guide to those who wanted to produce sentences in the language. The formulation of generative statements assumes a descriptive study. The difference seems to me to be one of emphasis rather than kind.

When we speak of transformation, however, we are dealing with a statement about technique rather than purpose. It is one of the modes of operation of the generative grammarians. The language is conceived of as consisting of a number of kernel sentences; by employing a number of transformations, such as the change from active voice to passive, or a number of successive transformations, a large number of sentence, clause, and phrase patterns may be generated. Transformations have proved to be extremely useful in clearing up structural or syntactic ambiguities and in providing another way of dealing with syntactical relationships.

The Linguistic Method

Let me conclude by referring briefly to the way in which the linguist studies languages and his attitude toward his material. We must understand that all language study employs a sampling technique. Almost never has anyone been able to examine the totality of a language. When this has occurred, as in the case of the frag-

ments of Minoan Greek or Tocharian, or a living language with only two remaining speakers as was true of Chitemacha, what is left is in itself a fragment or accidental sample.

Since the linguist is committed to a sample, he is concerned that it be representative and authentic. Authenticity means studying the language as it actually exists, not someone's opinion about it or what it ought to be. A representative sample is one which does not place unreal emphasis upon certain features to the exclusion of others. In short, the linguist selects his materials just as any other scholar would. He examines them quite as systematically as any science would demand. His classifications are established and his conclusions are drawn with the rigor which would be a norm for any logical operation. If we will keep in mind these means and ends, and in addition make allowance for the fact that the material with which the linguist deals serves also as the cloak for our thoughts, linguistics will seem that much less the mysterious science.

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